

REMARKS

With claims 1 and 42-56 pending, claims 43-44, 51-52 and 54-56 have been cancelled, claims 1, 45, 49 and 53 have been amended, and new claim 57 has been added as indicated above.

Section 102 Rejections

Claims 1 and 42-50 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Nulman et al. (US 4,496,419). The Office Action states Nulman teaches a method comprising: covering a substrate (workpiece) 12 with an aluminum film (same as applicant's hard mask) 14, oxidation mask 16, and resist 18 (column 4, lines 8-13, 21-22); oxidizing the surface of aluminum film 14 by O₂ plasma (column 3, lines 1-5) that produces surface layers of aluminum oxide (Al₂O₃ that is the same as applicants' oxide skin on the exposed surface of the hard mask) on the exposed surface portions of film 14 (column 5, lines 3-4); and the Al (same as applicant's hard mask) film serves as an etch mask for the underlying substrate, the pattern being transferred to that substrate by means of any suitable dry etching process such as reactive ion etching (column 3, lines 18-23). Based on the above amendments and the following remarks, this rejection is now believed to be overcome.

Claim 1 has been amended to claim that the hard mask is patterned to expose portions of the layer to be etched, and remains substantially unoxidized prior to the etching process. Referring to Figs. 1-9 of Nulman, Nulman discloses oxidizing its metal film 14 (corresponding to applicants' hard mask) in Fig. 5 before etching in a subsequent step to expose the underlying layer 12 in Fig. 7. By combining the step of oxidizing the hard mask with etching the underlying layer, a more efficient process is provided by applicant's invention which is not disclosed by Nulman. Claim 1 is, thus believed allowable as not anticipated under 35 U.S.C. § 102 by Nulman.

Claims 45 and 49 have been amended to correspond with the amendments to claim 1, and are believed allowable as not anticipated by Nulman based at least on their dependence on claim 1.

Claim 53 has been amended in a similar manner to claim 1 to claim that the hard mask is patterned to expose portions of the layer to be etched, and remains unexposed to a gas which reduces either its sputtering yield or erosion rate until prior to etching of the layer. Claim 53, like claim 1 is, thus believed allowable as not anticipated by Nulman.

In light of the above amendments and remarks, claims 1, 42, 45-50, 53 and 57 are all believed allowable under 35 U.S.C. § 102 as not anticipated by Nulman. Accordingly, reconsideration and allowance of these claims is respectfully requested.

No fee is believed due with this response. Should a fee be due, the Commissioner is authorized to charge any underpayment to Deposit Account No. 06-1325.

Respectfully submitted,

Date: 11/3/03

By: Thomas A. Ward
Thomas A. Ward
Reg. No. 35,732

FLIESLER DUBB MEYER & LOVEJOY LLP
Four Embarcadero Center, Fourth Floor
San Francisco, California 94111-4156
Telephone: (415) 362-3800